# Zero Retries issue 0124 2023-11-10

***Zero Retries is an independent newsletter promoting technological innovation in Amateur Radio, and Amateur Radio as (literally) a license to experiment with and learn about radio technology. Now in its third year of publication, with 1000+ subscribers.***

**About Zero Retries (recently updated)**

## Steve Stroh N8GNJ, Editor

**Jack Stroh, Late Night Assistant Editor Emeritus**

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**Web version of this issue - https://www.zeroretries.org/p/zero-retries-0124**

### Request To Send

*Commentary by Editor Steve Stroh N8GNJ*

**New Paid Subscribers**

My thanks to new Paid Subscriber "Prefers to Remain Anonymous 16" for their financial support of Zero Retries.

My thanks to new Paid Subscriber Edward Mitchell KF7VY. Ed is an old friend who formerly published the excellent Ham Radio Online blog1 which concluded after a nice run of twelve years. I learned a heckuva lot from HRO. KF7VY offered this public message:

> I've known Steve for a long time. He writes well about an important subject for amateur radio. Happy to support his work.

Financial support is a real vote of confidence for continuing to publish Zero Retries.

**Meadow Day Video Now Available**

A well-edited *watchable* video (9 minutes of the total 23 minutes) of the Zoom videoconference between Budd Churchward WB7FHC and I during my Meadow Day exercise (aka Starlink field deployment) is now online. My thanks to Budd Churchward WB7FHC for his excellent editing and his participation in my Meadow Day experiment.

**Correction on FCC Meetings**

In Zero Retries 0122 - FCC Proposes to Delete Symbol Rate Limitations from US Amateur Radio Regulations I made a significant error of fact. I said:

> A source of reliable information about the FCC pointed out that the FCC could have "slipstreamed" this item into a regular meeting of the FCC rather than including it in a public, open FCC meeting.

That statement was incorrect, and the fault is mine for poor comprehension of the FCC's administrative process. Correcting my statement:

*The FCC commissioners only meet in a public meeting. They do not meet (as a full commission) at any time other than the public meeting.*

*The FCC commissioners can vote on matters before it apart from their public meetings.*

I've updated the article with that correction.

**FCC, AI, and Amateur Radio**

I don't remember now which recent development related to Artificial Intelligence triggered this thought, but it combined in my mind with the thought of how difficult it will soon be for the FCC to regulate data communications on Amateur Radio (and other radio services) when AI becomes fully functional. A lot of folks don't realize that not all AI requires a data center to do useful AI work - there are versions of AI Large Language Models (LLMs) that will run standalone on small systems. I'm imagining something like:
**N8GNJ:** Computer, look at the input to this radio data communications mode, and the over the air output. Improve the data rate without exceeding the regulated channel size for each band. The improved method must be consistent for all input data.
**Computer (AI):** Done - improvement of 200% faster data rate was achieved.
**FCC:** N8GNJ - State what modulation method you were using for this transmission?
**N8GNJ:** I have no idea - the AI engine I set up on my Raspberry Pi 5 computer figured it out by itself. I documented it on my web page with the AI model, the computer I used, the data I used to instruct the AI, and the prompt I used to get achieve this new, more efficient data communications method.

*Soon enough, we will all be having conversations like that one with our shack computers.*

**Starlink and IPv6**

Following up on my mention of IPv6 on Starlink, assuming you have a Gen2 or Gen3 Starlink router, IPv6 now "just works", as of sometime mid-2023. Starlink assigns your unit IPv6 IP addresses (claimed to be a /56) that do seem to be *inbound* routable from the Internet (unlike the IPv4 address assigned by Starlink using Carrier Grade Network Address Translation [CGNAT]). At least with my office Mac, connected via Ethernet to my Starlink router, my Mac has a valid IPv6 address and after some experiments, I was able to ping my friend and fellow Starlink user Ren Roderick K7JB's systems. K7JB is more network-savvy than I am, and he had put his Starlink router into bypass mode and made use of a more capable router to conduct our brief ping experiment.

**Co-authors**

It's really cool that I'm featuring other author's writing here in Zero Retries. In this issue, I'm grateful to:

- Jonathan Naylor G4KLX for the article on MMDVM. The source material was a bullet point presentation, and my minor contribution was to lightly format and edit it for easier reading.
- Kay Savetz K6KJN for the article on DLARC. Kay suggested these articles a few months ago and has been reliably providing monthly updates on all the cool things being added to DLARC.
- Mark Herbert G1LRO for contacting me to let me know about a major update to his Universal Radio Controller. For the Zero Retries article, I excerpted his blog post and added some commentary.

I'm also grateful to those who provide tips on interesting developments that I wouldn't have otherwise known about, such as Peter Dahl WA7FUS, a knowledgeable prefers-to-remain-anonymous source, Pseudostaffer Jeff Davis KE9V, Randy Neals W3RWN / VE3RWN, Tom Fanning M0LTE, and Pseudostaffer Orv Beach W6BI (even if his contribution this issue was only a tease).

It feels really great to see Zero Retries gradually becoming the collaborative effort that I imagined when I started it, that readers would become participants in informing *all of us* about the cool and interesting technological innovations that are happening *now, and all around us*, in Amateur Radio.

***Thank you, Zero Retries Readers!***

73,

Steve N8GNJ

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## Multi-Mode Digital Voice Modem (MMDVM) Update - October 2023

By Jonathan Naylor G4KLX

**This article is adapted from G4KLX's presentation at Pacificon 2023 in San Ramon, California, USA. Unfortunately, there is no recording of this presentation (that I'm aware of). - Editor**

**MMDVM / MMDVM Host Updates - FM Repeater**

- Biggest request at Hamcation was to add an FM repeater option
- Previously had an FM Repeater program that was moderately successful which ran alongside the original D-Star Repeater with hardware lockout
- New MMDVM FM repeater is fully integrated and is automatically detected by use of CTCSS tones
- First version was RF only
- Second version allows for external PCM audio via the USRP protocol
- It allows for duplex, simplex, and gateway operation
- Completely customisable in terms of tones, CW speeds, and general operation so no two MMDVM FM repeaters need sound the same. The default sound is of GB3FR in the early 1980s
- Some radios include Mic-E APRS transmissions and so I added 1200 bps AFSK AX.25 demodulation alongside the FM repeater
- Code taken from mobilinkd and modified for the MMDVM sample rate
- Added a transmit option also

**MMDVM / MMDVM Host Updates - M17**

- Added initial M17 support at end of 2020
- Helped modify the M17 specification during 2021 and tracked the changes in the MMDVM
- M17 has been a full member of the MMDVMs DV protocols ever since

**APRS Gateway**

- Created to reduce the load on the APRS-IS servers
- All the DV gateways channel their APRS data to this single gateway
- Except for the DMR Gateway and the P25 Gateway

**DG-Id Gateway**

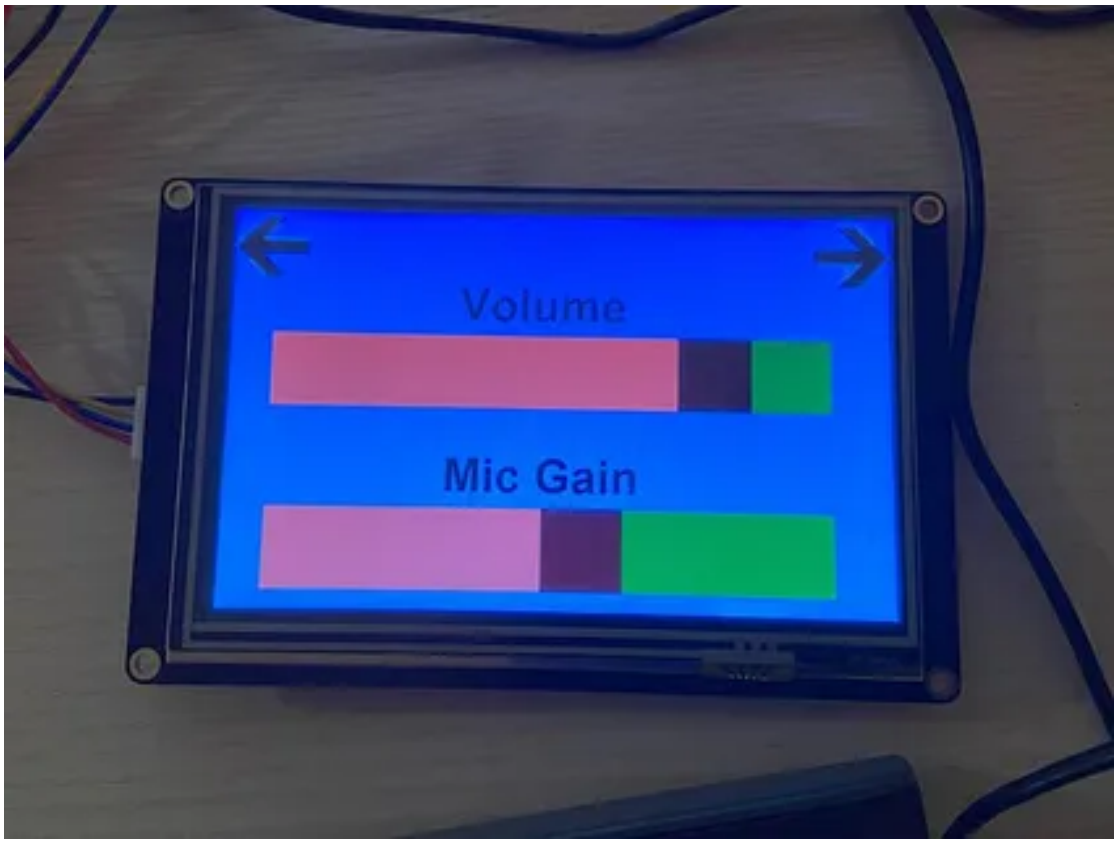
- Follows the same pattern as Yaesu Wires-X 2 using the transmitted DG-Id as control
- Each DG-Id is used to control linking to various FCS and YSF reflectors, as well as cross mode modules
- Can be stacked with the original YSF Gateway as original Wires-X only works with a DG-Id of 00 (Yaesu software limitation)
- Plan to add the IMRS double and triple pip indication of the connection state
- Plan to add IMRS

**M17 Gateway**

- Has similar facilities to the other DV gateways
- These include an ECHO facility, linking and unlinking, and an INFO command. These include the usual multilingual voice prompts.
- The list of M17 reflectors is pulled from a central repository as needed

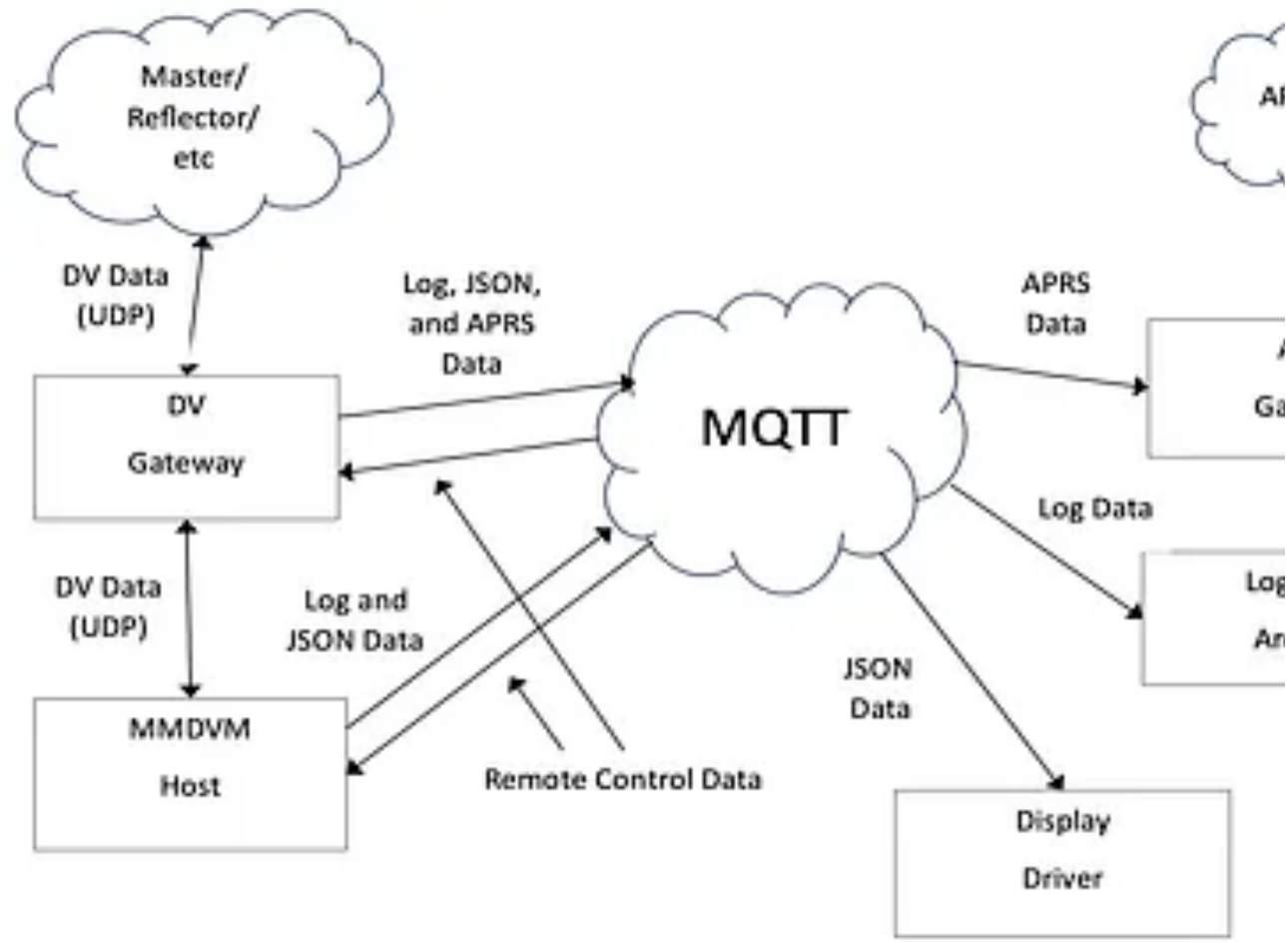
**M17 Client**

- Allows an MMDVM modem or hotspot to be used as M17 RF with a Raspberry Pi
- Can be driven by a standard GUI or by touchscreen controls
- Includes some of the extensions to M17 that I proposed:
    - Extended callsigns
    - GPS data
    - Short text data




**MQTT Changes**

- Make log data available
- Make event information available for GUIs and other users in JSON format
- Remove the writing of data from the programs wherever possible
- Used for remote commands
- Used for feeding display data back to Nextion screens attached to the modem/hotspot
- Used for APRS data into the APRS Gateway
- Not used communication between the host and gateways




- Schemas for all of the JSON data are included in the GitHub repository
- Not currently in the master branch

**Display Driver**

- Move all display handling to outside of the MMDVM Host
- Data is obtained from the host via JSON events
- May use Nextion screens either directly or attached to the MMDVM modem/hotspot board
- Gives flexibility to add new screen types without having to modify the main host code.

**MMDVM-TNC**

- A limited use TNC using standard MMDVM modem hardware
- Uses standard KISS commands on the serial port
- Has a number of modes:
  - Mode 1 is 1200 bps AFSK AX.25 from the MMDVM
  - Mode 2 is 9600 bps C4FSK IL2P
  - Mode 3 is 19200 bps C4FSK IL2P
  - Mode 4 is 38400 bps C4FSK IL2P (future development)
- All C4FSK modes are based on DMR waveforms but incompatible with DMR
- No transmit or receive inversion settings ☺
- IL2P is a new open standard for adding FEC to AX.25 data and compressing the header data
- Should allow for good data throughput on dedicated links using 9600 bps capable radios

- May look at M17 data streaming mode in the future
- New modes will be supported by the TARPN Nino TNC in due course

**Future Work**

- Look at STANAG 4538 packet mode in the MMDVM-TNC?

…

**My interest in MMDVM had been mostly the new MMDVM-TNC capability, but there's a lot more "layers to the onion" of MMDVM such as the new FM Repeater mode and the M17 features. There's a lot to digest here, and I could probably be exchanging emails with G4KLX for a week on a number of points, given that I'm a newbie to MMDVM. I remain impressed with G4KLX's capabilities; as an example, his casual mention of implementing STANAG 4538 is interesting considering that the (apparently) official documentation of STANAG 4538 is 630 pages! - Editor**

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### What's New at DLARC - November 2023

By Kay Savetz K6KJN

*Hello from the headquarters of the Internet Archive's Digital Library of Amateur Radio and Communications. Here's a peek into what we've added to the archive in the past month.*

I've added two podcasts about the FCC. The first is More than Seven Dirty Words - the official FCC podcast. They described it as "The FCC is more than 'Seven Dirty Words.' It's over 1,400 employees, 80 years of history, and countless untold stories and unsung heroes. The Official FCC Podcast will bring you those stories, featuring interviews with FCC staff and others in the communications space." Episodes were published from August 2018 though January 2021, which was the end of "Season 1" and — apparently — the end of the podcast entirely.

The other podcast is FCC Today with Michi Bradley. Published since 2021, it focuses on FCC news, decisions, and controversies. She seems to have a particular interest in low-power FM.

I've also added a complete archive of Radio Survivor, a podcast and radio show that focuses on community radio, college radio, low-power FM, public access TV, podcasting, and internet radio. The first episode was published in 2015, and the most recent episode features an interview with me. We had a great conversation about DLARC and radio in general. There are two versions of most episodes: a strict-time-limit one-hour broadcast version, and a longer podcast version. I felt that our conversation really got going after the one-hour mark when we loosened up a little. The hosts *really* know radio from all the angles. I left the interview with a long to-do list of additional resources to research for possible inclusion in the DLARC library.

I've finished archiving material from the International EME Conference, the moonbounce communications con that first took place in 1966. The material — PowerPoint decks, papers, recorded talks, and photos — were scattered in more than dozen places. For the first time they're browsable and searchable in a single digital location. (The next EME conference will take place in Trenton, New Jersey August 9-11, 2024.)

And newsletters! I've added newsletter collections from four more ham radio groups. Working west to east, there's 400+ issues of the W6TRW Amateur Radio Club "Bulletin", published in Redondo Beach, California since 1968; 187 issues of the Rochester (New York) DX Association Newsletter; 194 issues of Massachusetts' Minuteman Repeater Association "The Minuteman" newsletter; and from Maine, a few issues of the the Merrymeeting Amateur Radio Association Squelch Tales newsletter.

My colleagues at the Internet Archive's scanning center in Fort Wayne, Indiana have been busy scanning the physical material acquired by DLARC, primarily though donations from people like you. More than 550 items have been scanned since October 1. I still need to go through them to clean up the titles and other metadata, but take a look and you'll find endless radio catalogs, manuals, and books to explore. Service manual for a Kenwood Model TV-502S 2M transverter? Got it. Proceedings of the RAWCON 1998 IEEE Radio and Wireless Conference? Covered. Manual and schematics for an EICO Tube Tester 625? A borrowable book on monitoring NASA communications? Sure thing.

If you'll permit me a paragraph for a non-radio tangent: if you like old electronics catalogs, check out the collection of DAK Catalogs uploaded to Internet Archive this week by my friend Cabel. In the 1980s and 1990s, DAK Industries mailed glossy catalogs selling high-tech gadgets described with sales copy that made the gear *so* enticing. Also read Cabel's fascinating blog post about the history of the catalog.

Digital Library of Amateur Radio & Communications is funded by a grant from Amateur Radio Digital Communications (ARDC) to create a free digital library for the radio community, researchers, educators, and students. If have questions about the project or material to contribute, contact me at kay@archive.org.

**My Thanks to K6KJN for these regular updates on DLARC and for his DLARC work on behalf of Amateur Radio. He, and DLARC, are making a huge difference for Amateur Radio! - Editor**

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### SOTAMĀT - POTA and SOTA Self-Spotting Without Internet

By Steve Stroh N8GNJ

*As I understand self-spotting, it's the process of registering on the respective Parks On The Air (POTA) and Summits On The Air (SOTA) websites that you will be activating a particular park or summit at a specific time and date, so that others can know that you're there and attempt to work you.*

SOTAMĀT is an elegant hack (said in admiration) to the issue of using… or not having available… an Internet connection to "self spot" a POTA or SOTA activation.

SOTAMĀT is an Android / IOS app that generates FT8 audio that you can use an audio cable… or just acoustically couple… from the phone's speaker → radio's microphone to briefly transmit SOTAMĀT data. Thus, instead of Internet, SOTAMĀT uses *Amateur Radio* to do a self-spot:

> Have you tried activating a SOTA peak or POTA park but had trouble self-spotting? Do you feel 'dirty' self-spotting an amateur radio activity with non-amateur cell-phone or satellite methods? Do you wish you had a simple way to find Summit-to-Summit (S2S) and Park-to-Park (P2P) opportunities in the moment? Do you wish you could send a message to a friend, but cell and APRS services were spotty in the mountains?
>
> …
>
> The SOTAmāt server listens to PSKreporter for reception reports of your (preregistered) callsign with a special SOTAmāt suffix (specific to your personal SOTAmāt configuration). This callsign suffix encodes a command for SOTAmāt to execute (such as a self-spot for a particular summit-ID or park-ID, or to send an eMail message).

SOTAMĀT is Technological Innovation in Amateur Radio (it's particularly elegant how it leverages PSKreporter), Zero Retries Interesting, and again, quite an elegant hack. Kudos to SOTAMĀT creator Brian Mathews AB6D.

My thanks for Pseudostaffer Jeff Davis KE9V for alerting me to SOTAMĀT (and some brief explanations about POTA and SOTA procedures).

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## Universal Radio Controller Expansion - APRS Digipeater & KISS Modem Personality Board

By Mark Herbert G1LRO (block quotes), with commentary by Steve Stroh N8GNJ

*Background:*

- *Introducing the Universal Radio Controller V2*
- *Latest V2.2 Controller Overview*.

> The first option board created to use the expansion port in the URC is a KISS modem and APRS digipeater based upon the VP-Digi Blue Pill module. This module connects to an attached transceiver and the URC seral port to provide true modem capabilities for packet radio.
>
> There's a video of the URC & modem in action in my Facebook page here https://fb.watch/od0tSxN1Fg/
>
> VP-Digi offers **8 configurable beacons** and an **APRS digipeater**, which is capable of handling **4 type n-N aliases** (e. g. WIDEn-N, NYn-N) and **4 simple aliases** (e. g. CITY, AREA). Moreover, the digipeater incorporates the **viscous delay** function know from aprx, which can reduce unnecessary traffic. There is also a posibility to filter packets by sender callsign, either in **blacklist** or **whitelist** mode. The digipeater can be freely configured, e. g. to work as regional (Wn) or fill-in (W1) digi.
>
> The device also uses the serial port to work in KISS TNC, frame monitor or configuration mode. The configuration is done by simple commands using any terminal program and is stored in the embedded flash memory.
>
> VP-Digi comes with four selectable modems: **1200 Bd** Bell 202 (VHF standard), **9600 Bd** G3RUH (UHF standard), **300 Bd** Bell 103 (HF standard) and 1200 Bd V.23 (alternative VHF standard).
>
> **FX.25** protocol support is included, which enables error correction for better reliability. The FX.25 protocol is fully compatible with existing AX.25 protocol.

VP-Digi installed on Universal Radio Controller. Image courtesy of Mark Herbert G1LRO

It took me a bit to understand this. The native capability of the Universal Radio Controller is “audio interface” (aka “Sound Card”, aka software defined modem). Installing the VP-Digi option adds “conventional TNC” capabilities - fixed modems, APRS digipeater, and KISS TNC interface, including FX.25 Forward Error Correction (FEC) that’s backwards compatible with AX.25.

**VP-Digi**

While it’s notable to have “audio interface” *and* “TNC” capability in the same unit, one of the understated items in the above is the **VP-Digi**, which I was not previously aware of. Per the VP-Digi creator’s website:

> The device is based on a popular “Blue Pill” board with STM32F103C8T6 microcontroller. This board can easily be found on websites like Ebay, Aliexpress etc. at the price of about [$4].

Only a few additional components (and, of course, software) are required to create a VP-Digi from a “Blue Pill” controller. The capabilities of the VP-Digi

are impressive, such as:

> Additionally, a digital carrier detection (DCD) is implemented. It uses an approach of looking for correct modulated signal rather than checking demodulated data. This algorithm provides much better results, is more sensitive, but at the same time is more immune to noise. That's way VP-Digi works very well with devices with open squelch.

DCD (usually an acronym for Data Carrier Detect) is rare on units that cost 10x or even 20x the price of the VP-Digi.

The Universal Radio Controller was an impressive unit even before this update. Now it's even more impressive. Kudos to G1LRO!

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### My Speculation on a Potential Kenwood TM-D710A - Restart or Redesign?

By Steve Stroh N8GNJ

*This article began by a question being asked on Facebook's **KENWOOD TM-D710G radio** group - if the popular Kenwood TM-D710A (and variants for other markets) would be restarted (the implication was "with the same features") or not.*

*I replied in that group, and this article is an expanded version of my answer there.*

*As the title says, this is my speculation. I have no inside information or other insights as to what is actually going on at Kenwood.*

*If Kenwood were to do the smart thing (in my opinion) and choose to redesign, at least redesign the packet radio modem section of the radio, then it would make sense to incorporate other redesigned features, but those other features are beyond the intended scope of this article.*

*It dates me considerably… but I admit that it's hard to wrap my mind around just how much processor power is available for so little expense, to be able to dedicated to mundane functions like a low-performance Amateur Radio Packet Radio modem. I'm writing this article to help explain this point to folks who, like I used to, think of modems as discrete components (chips) rather than software.*

In the case of a unit like the D710, instead of a modem chip with fixed functionality (9600 FSK / 1200 AFSK), it's now more cost effective to use an embedded cheap general purpose processor to perform modem functions.

(In the Facebook group, someone took the above to imply that I was suggesting an external audio interface and computer.)

No need to involve an external computer like a PC - this can all be done with just a few chips and do the modem function in software running on the embedded processor. Thus, new design using this approach with similar functionality as the previous unit.

(In the Facebook group, someone else asked why they didn't do this on the new Kenwood TH-D75A portable.)

Kenwood might not have done this in the D75 for space or power budget , but for a unit like a successor to the D710, there's ample room and power budget for this approach. We do this now with compute functions - *light bulbs* have processors. Now it's moving to audio frequency modems and soon it will be inexpensive to do radio functions as just a big, fast A/D and D/A converter.

I base my speculation on what I observed with the project called the TNC-Pi9k6 that was developed by John Wiseman G8BPQ. The TNC-Pi9k6 is a KISS TNC for 9600 bps that was originally a product of Coastal Chipworks, which closed down before, or shortly after that product was introduced. The TNC-Pi9k6 is still available as a kit. What's impressive about the TNC-Pi9k6 is that a KISS TNC is mostly a modem, with all the protocol functions handed off to a host computer via the KISS interface. In the case of a TNC-Pi9k6, the modem is yet another processor - the (now discontinued) Teensy board version 3.6 by PJRC (now replaced by the [presumably more capable] Teensy 4.1).

The point is that modems, even simple low-performance ones like 1200 bps Audio Frequency Shift Keying (AFSK) or 9600 bps Frequency Shift Keying (FSK) are easier, faster, cheaper, and *better* to do in software rather than embedded in a fixed hardware chip. You can either do the modem software in a host computer, such as, for example, an audio interface like Masters Communications Digital Radio Adapter series and a software Modem / TNC running on a host computer, like Dire Wolf, or…

*you can put the modem software in an embedded processor like the Teensy in the TNC-Pi9k6.*

The NinoTNC also uses this approach, using the Microchip dsPIC33EP512GP502 processor and exemplifies the *better* aspect. NinoTNC designer Nino Carrillo KK4HEJ not only used the processor and wrote software to create a 1200 bps AFSK / 9600 FSK (and other speeds) modem, he also created a new Forward Error Correction (FEC) system called Improved Layer 2 Protocol (IL2P) that ran on that chip, not on the host computer (as I understand it).

**Late update** - a third example of this embedded processor as an Amateur Radio Packet Radio modem trend is the VP-Digi, discussed in the article above - **Universal Radio Controller Expansion - APRS Digipeater & KISS Modem Personality Board**.

Thus my speculation is that if Kenwood were to decide to "restart production" of a $600+ mobile radio for Amateur Radio use, they would be ahead on design time, cost, and functionality by using a "embedded processor as modem" approach like the TNC-Pi9k6 and the NinoTNC. Kenwood could, conceivably, even support IL2P and FX.25, which I will speculate that would make it a very popular data radio.

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### ZR > BEACON

By Steve Stroh N8GNJ

*Short mentions of Zero Retries Interesting items.*

**Amateur Radio is Number 5…**

On the final (?) [agenda of the FCC Open Commission Meeting on 2023-11-15]:

> **TITLE:** Amending Amateur Radio Rules for Greater Flexibility in Data Communications (WT Docket No. 16-239)
>
> **SUMMARY**: The Commission will consider a Report and Order and Further Notice of Proposed Rulemaking that would eliminate the symbol rate (also known as baud rate) limitation and establish a bandwidth limitation that would provide flexibility to use modern digital emissions, thereby promoting innovation and experimentation in the amateur service. The item would also propose removal of the baud rate limitation in several additional bands.

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**PMR-171 Software Defined VHF / UHF Radio (With Reasonable Transmit Power)?**

Zero Retries reader and friend Peter Dahl WA7FUS pointed out the PMR-171 radio(s) that claim to be software-defined HF / VHF / UHF. This is another widely-copied radio design available from numerous manufacturers with the same name and copy / pasted web pages, documentation, etc.

Image courtesy of DXZone.com

It looks interesting. The most credible link I found (from a quick look) was a review (I think) on DXZone.com - [PMR-171 SDR HF VHF UHF Transceiver], but a web search will show many of this same (?) radio from a number of different (?) manufacturers. My usual plaint is those few VHF / UHF Software Defined Transceivers exist, can only transmit at power levels of a few hundreds of milliwatts. It's a crapshoot to source a buffer amplifier to get that power level up to the minimum threshold that power amplifiers require for full power. In the case of the PMR-171, VHF / UHF power levels are specified as ≤ 10 watts.

I didn't see any indication that users can modify the operational capabilities of this radio, thus the "Software Defined" claim is probably that the manufacturer uses Software Defined Radio techniques and firmware to define the functionality of the radio, but doesn't allow users to change that

functionality. If users could change the radio's functionality, then this radio would be really interesting.

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**AMSAT-UK Figures Out GEO Payload?**

AMSAT-UK held its 2023 Colloquium on October 14 and 15, 2023 in conjunction with the Radio Society of Great Britain (RSGB) 2023 Convention at Milton Keynes, UK.

On the Convention schedule, **Lecture Room 5 - AMSAT** had two intriguing-sounding talks:

- 9.45 - 10.15 - Frank Zeppenfeldt PD0AP - **Geostationary Microwave Amateur Payload Proposal**
- 15.15 - 15.30 - Karl Kaas OZ2KK - **Space Inventor A/S First CubeSat to GEO**

Both titles hinted of an Amateur Radio payload or satellite into Geosynchronous / Geostationary Earth Orbit - GEO.

But I could not find any further information on either of these talks - no recordings, no papers, etc. It would certainly be interesting to know more about what PD0AP and OZ2KK discussed / discovered / developed for getting another Amateur Radio satellite or payload into GEO.

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**Discovery Dish for Weather Satellite and Radio Astronomy**

> Discovery Dish is a 65-cm aluminum satellite dish with an active filtered feed. It is designed for receiving real-time weather data from GOES HRIT, GK-2A LRIT, FengYun LRIT, NOAA HRPT, Metop HRPT, Meteor M2 HRPT, and other weather satellites that operate around 1.69 GHz. The dish is designed to weigh under one kilogram and splits into three petals, making it easier to ship worldwide. The 1.69 GHz feed contains a built-in LNA and filter right at the feed point, which means there is almost no noise figure loss from cables or connectors. The feed electronics are encased in a waterproof enclosure, meaning no external waterproofing work is required. We also have feeds for 1.42 GHz hydrogen line radio astronomy and 1.5 GHz Inmarsat STD-C and AERO.

This is yet another Zero Retries Interesting crowdfunded project via Crowd Supply. I'm almost to the point where Crowd Supply is such a reliable source of Zero Retries Interesting items that it deserves regular mention. My thanks to Pseudostaffer Jeff Davis KE9V for spotting this item.

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**UK Packet Network Wiki**

> This is a resource for sharing information about the UK packet radio network. The purpose of this site is to support the restoration and improvement of a UK-scale amateur radio-centric data network. The site is newly created, with content being added as contributed. Anyone can contribute…

In my opinion, a Wiki is a perfect method for providing this information.

Another element of this wiki is Monthly Packet Updates.

> Every month we try to collate the latest news and updates from the packet radio world.

My thanks to Tom Fanning M0LTE via Mastodon for mentioning this development.

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**Ex-Parte Comment on WT Docket No. 16-239 from ARRL**

> We make one suggestion for the Further Notice with regard to one band. The 219-220 MHz segment of the 1.25 meter VHF band is allocated to the Amateur Radio Service on a secondary basis solely for use by fixed point-to-point stations for forwarding digital messages. There is no symbol rate limit associated with this segment, but there is a 100 kHz bandwidth limit, 47 C.F.R. § 97.307(f)(13). Inasmuch as comment will be solicited on bandwidth limits for the other amateur VHF bands, including the 222-225 MHz segment of the same 1.25 meter band, we request that the 219-220 MHz segment be included in the discussion for possible change.

It will be interesting to see if this suggestion to discuss revisiting the Amateur Radio secondary allocation on 219-220 MHz. I'll be especially interested to see if the ARRL has any suggestions for using this band considering that the allowable usage is data-only and there's currently no reasonable solution for a high speed + reasonable power data radio for this band.

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**Kenwood TH-D75A Portable Radio to be Released 2024-01?**

*Kenwood has some of the worst press / public relations / marketing in the Amateur Radio industry. It's really amazing just how bad it is to try to tease information out of Kenwood's websites. Example - the Kenwood USA Amateur Radio products page still shows the TH-D74A, TM-D710GA, and TM-V71A as products, despite those radios being discontinued more than one year ago.*

In the Facebook group **Kenwood TH-D75A**, a PDF titled **TH-D75A_US_news-release_A3E_2023-11-8.pdf** was posted, but the person who posted it would not disclose where they obtained that PDF, and I was unable to find it on any of the various Kenwood web pages, either for the parent company in Japan or the USA page. While I don't think that PDF was a fake document — it's well written in the style of many other Kenwood announcements, and I *was* able to find the TH-D75A Press Release for Japan. But it's worrisome that I couldn't confirm the PDF from an actual source other than "a Facebook poster". So, under the premise of "probably not fake", here are some Zero Retries Interesting highlights from the USA version of the press release:

- Scheduled for sale in January 2024 at a price (very rough estimate) of $600.
- Standalone digipeater function - operate as a temporary APRS packet radio digipeater.

- D-Star DV fast data mode - sends data on unused voice frames. (The total D-Star data rate is 4800 bps, of which 3600 is normally allocated to Digital Voice + Forward Error Correction. DV Fast Data Mode allows most of the 4800 bps to be used for data.)
- Interfaces include Bluetooth HSP/SPP, microSD/SDHC memory card, and USB-C port, enabling connectivity with a host computer. (Presumably the USB-C port is the same one that charges the TH-D75A, but this isn't clarified in the press release.)

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**Reducing Raspberry Pi 5's Power Off Consumption by 140x**

> By default, the Raspberry Pi 5 (like the Pi 4 before it) leaves the SoC powered up (just in a shutdown state) when you shut down the Pi.
>
> Because of this, a Pi 5 will still sit there consuming 1.2-1.6W when completely shut down, even without anything plugged in except power.
>
> That's a lot—even compared to a modern desktop PC!
>
> Why is this?
>
> Apparently some HATs have trouble if the 3v3 power rail is off, but 5v is still active—which would be the case if you completely power off the SoC, but still have your 5V power supply plugged in.
>
> Because of that, the Pi ships by default with the setting POWER_OFF_ON_HALT=0, and the Pi eats up precious watts all the time.

Good tip by Jeff Geerling KF0MYB. It's Zero Retries Interesting as there are a number of uses of Raspberry Pi that are battery powered, and this will help keep the battery alive longer when the unit is "powered off", especially the Raspberry Pi 5 with that wonderful new Power (On / Off) button where you're inclined to push the Power button to gracefully shut down the system (talks to the operating system to request graceful shutdown) instead of the previous generations where it was good practice to do an OS shutdown, then remove power.

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**November– December 2023 issue of SARC's The Communicator**

**The Communicator** is an impressive "newsletterzine" published bimonthly by the Surrey (British Columbia, Canada) Amateur Radio Club. The current issue is 134 pages… easily rivaling some paid subscription magazines published by paid staff. The Communicator manages to do so with volunteer labor and distribution at zero cost, and honestly, I cannot tell in the layout and the editorial quality that this publication isn't produced by professional staff.

One excellent Zero Retries Interesting article in the current issue is **Gnuradio Conference - A digital radio update and a knotty problem solver** by Kevin McQuiggin VE7ZD / KN7Q on pages 14 - 22. VE7ZD gives an excellent snapshot of the just concluded 2023 GNU Radio Conference from the view of an Amateur Radio Operator, including discussion of *his* talk (YouTube), discussion of the Amateur Radio licensing session conducted at GRCon23, and mention of a discussion with Jon Kemper KA6NVY, Technical Director of ARDC. I was surprised to read that GRCon23 attendance was around 300 people, of which VE7ZD reported:

> Amateur radio is well represented in the gnuradio community. Dozens of the GRCon attendees were hams and attendees proudly displayed their callsigns on the conference name badges.

Between at least two talks that overtly discussed Amateur Radio, and a prominent Amateur Radio license examination, and the Amateur Radio attendees, it seems Amateur Radio was well-represented at GRCon23.

I also enjoyed the **We're QRT** (editorial) column on pages 130 and 131 by John Schouten VE7TI, one of the Directors of SARC (SARC Publications / Blog / Social Media & Courses). This issue's column was titled **Towards a younger demographic - A call for a change of attitude**. I found it Zero Retries Interesting that in the first three (of five) recommendations that VE7TI makes *for attracting younger members:*

- Integration with Technology: Embrace the tech-savvy nature of younger members by integrating modern technologies into the hobby, such as software-defined radios and digital communication methods.
- Education and Outreach: Amateur radio clubs and organizations can host workshops, webinars, and events targeting younger individuals. Demonstrating the fascinating world of radio technology, from digital modes to Morse code, can spark their interest.
- Promote Innovation: Encourage young members to explore new digital modes, develop software, and create applications that enhance the hobby's appeal.
- Community and Emergency Services: Highlight the role of amateur radio in emergency communication and community service. Younger members may be more inclined to join if they see the real-world impact of their hobby.
- Youth-Friendly Policies: Ensure that clubs and organizations have youth-friendly policies, affordable membership options, and support for new operators.

… he mentions *digital communications methods* and *digital modes*.

I couldn't agree more.

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**RAy3-10 - Amateur Radio 10.0 - 10.5 GHz Microwave Linking Radio**

Zero Retries reader and friend Randy Neals W3RWN / VE3RWN noted that Racom, a manufacturer of point to point microwave networking units based in the Czech Republic, offers the **RAy3-10** which includes the US Amateur Radio 10.0 - 10.5 GHz band.

> **RAy3**
>
> RAy3, the 3rd generation of RAy, with 1 Gb/s FDD for 10, 17, 18 and 24 GHz bands is designed for high performance links with maximum

reliability, exceptional system gain and resistance to interference. All relevant state-of-the-art concepts have been carefully implemented without compromise and proven in thousands of installations in dozens of countries from the poles to the equator. Due to its extremely low power consumption, RAy3 can run on solar panels.

*I have no other info about these products - see the link above for details.*

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**AREDN Intriguing Tease**

On one of the various AREDN mailing lists I monitor, there was this interesting email:

> **Subject:** AREDN test email
>
> Test email in preparation for the next AREDN software production release. Disregard.
>
> Thanks.
>
> 73
>
> Orv W6BI

No additional detail was immediately available, so I won't speculate. But feel free to comment.

Leave a comment

Share

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## Feedback Loop

Comments on Zero Retries 0123 (and my pithy and clever replies). My thanks to Ren Roderick, Paul Elliott, ReadyKilowatt, K4HCK Cale, and N6UOW for interesting comments.

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## Join the *Fun* on Amateur Radio

If you're not yet licensed as an Amateur Radio Operator, and would like to join the fun by *literally having a license to experiment with radio technology*, check out
**Join the Fun on Amateur Radio** for some pointers.

**Zero Retries Frequently Asked Questions (FAQs)** — In development 2023-02.

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## Closing the Channel

In its mission to highlight technological innovation in Amateur Radio, promote Amateur Radio to techies as a literal license to experiment with radio technology, and make Amateur Radio more relevant to society in the 2020s and beyond, Zero Retries is published via email and web, and is available to everyone at no cost. Zero Retries is proud *not to participate* in the Amateur Radio Publishing Industrial Complex, which hides Amateur Radio content behind paywalls.

My ongoing ***Thanks*** to:

- Tina Stroh KD7WSF for, well, *everything!*
- ***Founding Members*** **who generously support Zero Retries financially:**
  Founding Member 0000 - Steven Davidson K3FZT
  Founding Member 0001 - Prefers to Remain Anonymous 01

  Founding Member 0002 - Chris Osburn KD7DVD
  Founding Member 0003 - Don Rotolo N2IRZ
  Founding Member 0004 - William Arcand W1WRA
  Founding Member 0005 - Ben Kuhn KU0HN
  Founding Member 0006 - Todd Willey KQ4FID
  Founding Member 0007 - Merik Karman VK2MKZ
  Founding Member 0008 - Prefers to Remain Anonymous 14
- Numerous Annual and Monthly subscribers who also generously support Zero Retries financially!

**Want to Support Zero Retries?**

- The *most* effective way to support Zero Retries is to simply mention Zero Retries to your co-conspirators that are also interested in knowing more about technological innovation that is occurring in Amateur Radio and encourage them to become a fellow subscriber.
- One particularly effective method of promoting Zero Retries is to add a mention of Zero Retries to your QRZ page (or other web presence) and include a link:

  https://www.zeroretries.org

- If you'd like to financially support Zero Retries, becoming a paid subscriber is *greatly* appreciated and helps offset expenses incurred in publishing Zero Retries. Paid subscriptions for Zero Retries are *entirely optional*, as explained in this special issue of ZR:
  Zero Retries Administrivia - Activating Payment Options.

**These blogs and newsletters regularly feature Zero Retries Interesting content:**

- Dan Romanchik KB6NU mentions "Zero Retries Interesting" topics so regularly on his blog (that I otherwise wouldn't know about) that I've bestowed on him the honorific of Pseudostaffer.
- Jeff Davis KE9V also mentions "Zero Retries Interesting" topics so regularly on his blog (that I otherwise wouldn't know about) that I've bestowed on him the honorific of Pseudostaffer.
- Amateur Radio Weekly by Cale Mooth K4HCK is a weekly anthology of links to interesting Amateur Radio stories.
- Experimental Radio News by Bennet Z. Kobb AK4AV discusses (in detail) Experimental (Part 5) licenses issued by the US FCC. It's a *must-read-now* for me!
- RTL-SDR Blog - *Excellent* coverage of Software Defined Radio units.
- TAPR Packet Status Register has been published continuously since 1982.
- Other Substack Amateur Radio newsletters recommended by Zero Retries.

**These YouTube channels** regularly feature Zero Retries Interesting content:

- HB9BLA Wireless by Andreas Spiess HB9BLA
- KM6LYW Radio by Craig Lamparter KM6LYW (home of the DigiPi project)
- Modern Ham by Billy Penley KN4MKB
- Tech Minds by Matthew Miller M0DQW

Zero Retries is currently using the Substack email publishing platform to publish Zero Retries. It's particularly suitable for small newsletters as you can get started for no cost.

If you're reading this issue on the web and you'd like to see Zero Retries in your email Inbox every Friday afternoon, just click below to join ***1000+*** other subscribers:

Subscribe now

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Offering **feedback or comments** for Zero Retries is equally easy — just click:

Leave a comment

If you're a fellow smart person that uses **RSS**, there *is* an **RSS feed for Zero Retries**.

**Zero Retries (N8GNJ) is on Mastodon** — n8gnj@mastodon.radio — just click:

Zero Retries / N8GNJ on Mastodon

Email issues of Zero Retries are "instrumented" by Substack to gather basic statistics about opens, clicking links, etc.

More bits from Steve Stroh N8GNJ:

- SuperPacket blog — *Discussing new generations of Amateur Radio Data Communications — beyond Packet Radio (a precursor to Zero Retries)*
- N8GNJ blog — *Amateur Radio Station N8GNJ and the mad science experiments at N8GNJ Labs — Bellingham, Washington, USA*

Thanks for reading!
Steve Stroh N8GNJ / WRPS598 (He / Him / His)
These bits were handcrafted (by a mere human, not an Artificial Intelligence bot) in beautiful Bellingham (The City of Subdued Excitement), Washington, USA, and linked to the Internet via **Starlink *Satellite* Internet Access**.

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1

Link is a random capture from the Wayback Machine.